

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Prabhakaran K. Centala et al.

Application No.: 10/809,276

Confirmation No.: 6042

Filed: March 25, 2004

Art Unit: 2128

For: RADIAL FORCE DISTRIBUTIONS IN ROCK  
BITS

Examiner: A. Saxena

**DECLARATION UNDER 37 C.F.R. § 1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

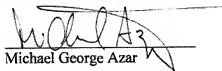
I, MICHAEL GEORGE AZAR hereby declare that:

1. My name is Michael George Azar. I am over the age of eighteen years, of sound mind and competent to make this declaration. The facts stated herein are of my personal knowledge, and I know them to be true and correct.
2. I received a Bachelor of Science Degree in Mechanical Engineering from State University of New York at Buffalo in 1985.
3. I have worked for Smith International for 25 years in various drafting, design, engineering, and management roles, involving Smith's fixed cutter or PDC drill bits. I have drafted numerous PDC bit drawings, designed numerous PDC bits, and now manage the PDC bit engineering department.
4. At this time, I am an employee of Smith International, Inc. My present title is Director of Design Engineering.

5. As Director of Design Engineering, my responsibilities include (among other duties) managing the design, engineering, CAD model preparation and maintenance for PDC drill bits. I also support the manufacture and sale efforts by Smith of its PDC bits.
6. The SPE article "Drag-Bit Performance Modeling," by T.M. Warren et al. ("Warren") is understood in the art as being part of the Amoco Program for modeling drag bits or polycrystalline-diamond-compact (PDC) bit designs, and is often referred to in the industry as the "Amoco Program."
7. U.S. Patent No. 6,695,073 ("Glass") refers to the Amoco Program.
8. I have seen the Amoco Program in operation.
9. The Amoco Program, including Warren and Glass, is directed to a static model of a PDC bit. That is, Warren and Glass disclose modeling a PDC bit based on single cutter interaction data points that occur at a given time. Warren and Glass provide generalized theoretical approximations (typically some equations) of the cutter and formation interaction.
10. Thus, when modeling a PDC drill bit, Warren and Glass generally provide a single numeric answer. For example, Warren and Glass may provide the volume of rock removed by a cutter, total weight-on-bit (WOB), bit torque, etc. (See e.g., Warren, page 119, left column, paragraph 5).
11. The model described by the Warren and Glass references does not provide a dynamic model or dynamic simulation of a fixed cutter drill bit drilling a formation. Thus, the Warren and Glass references do not teach or suggest using time as a variable. In fact, the Amoco Program in its commercial embodiment did not use time as a variable.
12. Furthermore, Warren and Glass fail to provide the design engineer with any use of pre-selected time as a variable, during simulation. As such, the Warren and Glass references cannot be said to disclose selecting a pre-selected amount of time, and thus, fail to disclose adjusting at least one parameter of the selected drill bit based on a generated ratio until a magnitude of the radial forces is less than a predetermined value for a preselected amount of time for a simulated drilling.

I further declare that all statements made herein of my own knowledge are true; and further that these statements were made with the knowledge that willful false statements are the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

  
Michael George Azar

Date AUGUST 6 2010